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## ABSTRACT

This study surveyed college students in one southern state to determine their sexual knowledge, attitudes, and behaviors. A group of 915 students (602 female and 313 male) attending 4 state universities completed the Sexual Knowledge instrument during class. The instrument contained 27 sex knowledge items, 5 demographic questions, 3 items to ascertain where they received K-12 education, and 4 items to ascertain whether they had received sex education in school at any point. If they had received sex education in school, they rated the quality of their programs on 15 sexuality topics. Data analysis indicated that the students performed relatively poorly on the sexuality knowledge test, with a mean percentage score of only 55.39. Statistical differences on sexual knowledge were found on gender, race, age, year in college, and previous sex education. African-American students' scores were significantly lower than were White students' scores. Students rated the overall quality of their sex education as fair to good. The higher the students perceived their previous instruction in certain areas, the lower their knowledge scores. (Contains 27 references.) (SM)

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**Sexual Knowledge of College Students in a Southern State:  
Related Factors and Impact of Previous Sex Education**

**Research Article**

### **Abstract**

In one southern state, the rates of teen pregnancy and sexually transmitted diseases are in the top five of the nation, yet schools may not provide sex education until 7<sup>th</sup> grade, and the quality of existing programs is questionable. In the state, youth under the age of 18 may not be asked sexuality related questions; therefore, college students were surveyed to obtain information about sexual knowledge, attitudes, and behaviors. This article contains the analysis of data from the sexual knowledge component. Participants were 915 students (602 female, 313 male) attending four state universities. The instrument contained 27 sex knowledge (SexK) test items and items asking where, how much and perceived quality of previous sex education. Results. Group SexK mean percentage score was only 55.39 (SD15.59). Statistical differences on SexK were found on gender, race, age, year in college and previous sex education. Participants' perceptions of quality of their previous sex education were inversely proportionate to their SexK level. Results clearly demonstrate the need for pre-college comprehensive sex education programs (CSEP).

Sexuality is a lifelong process that encompasses the biological, emotional, psychological, and social domains. It is a natural and healthy part of living,<sup>1</sup> and young people should be given the opportunity to learn sexuality information in an environment that is conducive to sexual communication.<sup>2</sup> Many states, however, have very poor school sex education programs concomitant with a lack of program evaluation. In this southern state, youth under the age of 18 may not be asked sexuality related questions; therefore, not much is known about the impact of any existing sex education programs. To obtain information on youth sexual knowledge, attitudes, and behaviors, college students were surveyed. This article contains a report of the sexual knowledge (SexK) component (relationship to the amount and perceived quality of previous sexuality education).

#### SEXUALITY EDUCATION

Although parents should have primary responsibility for the sex education of their children,<sup>2,3,4</sup> communities also have an obligation to provide quality sex education programs.<sup>1,3,4</sup> Therefore, the mission of formal school or church sexuality programs should reinforce and strengthen parental sexuality messages. Students, teachers, parents, and other community professionals can give input about the type and content of such programs by developing advisory boards.<sup>5</sup> Using age and developmentally appropriate goals and objectives,<sup>1,5,6</sup> sex education programs may begin at pre-school and continue through the 12<sup>th</sup> grade.

Controversy about school sex education programs does exist, but a greater number of parents support rather than oppose them.<sup>7</sup> An in-depth analysis on how Americans feel about sex education,<sup>7</sup> revealed that of 1,050 adults surveyed across the nation, 93 percent support the teaching of sex education in high school and 84 percent support sex education in middle school. In addition to parental support of sex education, approximately 117 national non-profit

organizations have formed a national coalition to support and provide advocacy for sex education programs.<sup>8</sup> Although surveys show wide support of sex education, a recent study reveals that sexuality education teachers do not feel supported by the community, parents, or school administrators.<sup>9</sup> Communities who care should communicate support to local teachers.

Many individuals have misconceptions about the content and focus of school sex education programs<sup>10</sup> believing that they do not advocate abstinence. A primary focus of school based sex education programs, however, is the inclusion of abstinence messages because of the strong belief that youth should attain emotional growth and maturity before committing to sexual relationships. Many communities are divided on whether or not to offer sexuality programs that only focus on abstinence or those that encourage abstinence but include sexuality health protection. A solution for some is to offer dual-track programs which allow parents a choice of curriculum.<sup>11</sup>

Rather than encouraging sexual experimentation or increased sexual activity, results of studies commissioned by the National Campaign to Prevent Teen Pregnancy, 1997 Joint United Nations Programme on HIV/AIDS, and the World Health Organization's Global Programme on AIDS demonstrate the reverse is true.<sup>4</sup> The reviews concluded that discussion of condoms and contraception delayed the onset of intercourse, reduced the frequency of intercourse, reduced the number of a person's sexual partners, promoted safer sexual behaviors, and reduced the number of unplanned pregnancy and STD rates.<sup>4</sup>

Other studies<sup>12,13,14,15</sup> also indicate that sex education was found to have: (a) promoted abstinence, (b) decreased sexual activity, (c) increased use of safer sex practices, (d) increased

teenage sexual responsibility, (e) increased sexuality related knowledge, (f) aided youth in more responsible sexual decision making, (g) delayed the age at which first sexual intercourse occurred and (h) did not encourage earlier or increased sexual activity or the number of sexual partners.

### **PURPOSE**

According to estimates from the nation's Youth Risk Behavioral Survey (YRBS),<sup>16</sup> by age 13, the percentage of students nationwide who reported they had engaged in sexual intercourse is 7.2% which places them at risk for pregnancy and STDs. Except for one parish in this state, sexuality education is not allowed until seventh grade, and the quality of instruction is questionable. Given that the teen pregnancy rate continues to be among the highest in the nation (97/1,000),<sup>17,18,19</sup> the percent of live births to moms under the age of 20 at 17.6 %, <sup>20</sup> and a national rank of four to five on STD rates,<sup>21</sup> an effort to determine the related factors is a priority. The problem is that youth under the age of 18 are not allowed to participate in sexuality surveys, therefore, little is known about their sexuality knowledge or previous sex education.

The purposes of this study were: (a) to determine sexual knowledge (SexK) levels, (b) to identify differences on SexK on various factors, (c) to determine the factor/s predictive of SexK, and (d) to assess relationship of perceived quality of previous sex education to SexK. Because of the inability to ask youth under the age of 18 sexuality related questions, college students age 18 and above were sampled.

### **METHODS**

#### **Subjects**

The subjects surveyed were 947 college students from four universities. Due to

incomplete surveys, data from 915 college students (602 female, 313 male), age 18 and above, were analyzed. To provide inter-university uniformity in the selection of classes, the same departments at each university were selected and from those, similar classes were selected (Biology, Psychology, English, Kinesiology, Physical Education, and Health Education). An effort was made to select classes which would hold a fairly even distribution of freshmen, sophomore, junior, and seniors.

### **Procedures**

The Institutional Review Board (IRB) at all four universities approved the study. Professors from each department at all four universities were contacted by e-mail. A formal letter asking for permission to come into their classrooms to conduct the survey was sent to them along with the description and purposes of the study. A copy of the survey instrument and cover letter was sent by file attachment. At the time of survey administration, the cover letter was read out loud and a copy was given to each participating student. Students were read their rights according to human subjects review, were given information about the types of questions to be asked, were not coerced to complete the questionnaire, and were assured of full anonymity.

All individuals who participated in data collection were briefed on the proper procedure. The current researchers, a few classroom professors, and undergraduate and graduate students (paid to help with data collection) administered the surveys.

### **Instrument**

The *Sexual Knowledge* instrument was developed by the researchers. The instrument contained the following: (a) 27 sexuality knowledge items; (b) five demographic questions; (c)



three items to ascertain where they received K-12 education; and (d) four items ascertaining if they had received sex ed. in grade school, middle school, high school or college. If participants indicated they had received sex ed in the schools, they were asked to rate the quality of their previous sex ed. on 15 sexuality topics using a scale of extremely poor (1) to extremely good (5). The 27 sexuality knowledge items tested four areas of sexuality: (a) reproductive system anatomy & physiology (9 items), (b) gender (2 items), (c) contraception or birth control (7 items), (d) STDs (5 items), and (e) HIV/AIDS (4 items).

Content validity was assessed by sending the instrument to four experts in sexuality education for review and comment. After revision, 27 knowledge items comprised the sexual knowledge portion. To ascertain readability of the instrument, it was first piloted to approximately 100 undergraduate students taking general education classes. As a result, some items were revised but none deleted. Reliability or coefficient of internal consistency was assessed by Guttman split-half which yielded a correlation of .7112. Equal length Spearman-Brown = .7129 and unequal-length Spearman-brown = .7131. Alpha for part 1 (14 items) = .6024 and Alpha for part 2 (13 items) = .5595.

A limitation of the study was that sample selection was based on convenience. The researchers obtained classrooms rather than conducting a random selection of students.

## RESULTS

### Subjects

Of the 915 participants, the majority were Caucasian (77%), female (66%), and between 19 and 23 years old (68%). Less than one-quarter of the sample indicated never having school-

based sex education (13%) or having sex education at the elementary (K-8) level (15%). Over half (64%) indicated having sexuality education in high school, and 43% indicated having sexuality education at the college level. The sample was divided fairly equally between freshman, sophomore, junior, and senior level students, and represented the three major areas of the state's population. Characteristics of the sample are provided in Table 1.

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Place Table 1 about here.

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### **Descriptive Statistics of Dependent Measures**

Sexuality Knowledge. In general, the sample performed relatively poorly on the sexuality knowledge test, averaging 55.39% (SD15.59) correctly answered items. Mean scores on sections of the knowledge test were, in decreasing order: contraception (66.4%), gender (60.6%), anatomy (53.7%), and STDs (47.4%).

Reported Perceptions of Quality of Sexuality Education. When asked to rate the quality of sex education received on a scale from 1 (extremely poor) to 5 (extremely good), the mean rating of the overall quality of sex education was 3.17 (SD=0.85). Content areas receiving the highest ratings were HIV/AIDS, STDs, STD protection, abstinence, and anatomy. Content areas receiving the lowest ratings were homosexuality, abortion, resistance, and date rape (See Table 2).

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Place Table 2 about here.

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### **Sexual Knowledge as a Function of Gender, Race, Location of Residence, College Classification, and Previous Sex Education**

To analyze the effects of selected variables on overall sexual knowledge (the total

knowledge test score), t-tests and one-way ANOVAs were used. Variables that were found to significantly impact participants' overall sexual knowledge were further investigated by examining their impact on test performance in specific areas of knowledge (anatomy, gender, contraception, and STDs). Discriminant analysis was used to identify which of the four test content areas separated groups. The content areas identified were then further analyzed using t-tests or one-way ANOVAs.

Sexual Knowledge as a Function of Gender. A t-test comparing the overall sexual knowledge among males and females indicated a significant difference,  $t(913) = 5.87, p < .001$ . As shown in Figure 1, females scored significantly higher on the knowledge test than did males and indicated males and females were differentiated primarily by their knowledge of contraception,  $F = 40.65, p < .001$ . A t-test confirmed this difference,  $t(913) = 6.38, p < .001$ , with females' knowledge of contraception significantly greater than males'.

Sexual Knowledge as a Function of Race. Overall sexual knowledge was also found to vary according to race,  $t(856) = 6.04, p < .001$  (see Figure 1). Due to a limited number of participants in race categories, these analyses were conducted only comparing Caucasian and African American participants. Discriminant analysis indicated these two groups could be differentiated by their knowledge in two areas: anatomy,  $F = 51.01, p < .001$ , and gender,  $F = 28.84, p < .001$ . T-tests confirmed these differences, with Caucasian students' knowledge scores in anatomy,  $t(856) = 7.14, p < .001$  and gender,  $t(856) = 4.19, p < .001$ , significantly higher than African American students.

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Place Figure 1 about here

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Sexual Knowledge as a Function of Location of Residence. A one-way ANOVA was used to compare the overall sexual knowledge of students divided by the location of their residence (north, southeast, and southwest) in the state. The results indicated no significant differences,  $F(2, 879) = 0.03, p > .10$ .

Sexual Knowledge as a Function of College Classification. A one-way ANOVA revealed that overall sexual knowledge varied with college classification,  $F(3, 902) = 38.66, p < .001$ . Depicted in Figure 2, sexual knowledge increased with each year in college. Further examination of this effect using the Tukey HSD procedure indicated significant differences among all classifications. Discriminant analysis indicated college classifications were separated by knowledge in two areas, STDs,  $F = 30.79, p < .001$ , and contraception,  $F = 20.22, p < .001$ . Scores in these two content areas were analyzed using one-way ANOVAs and the Tukey HSD procedure. The ANOVA conducted on STD knowledge revealed a significant group effect,  $F(3, 902) = 30.79, p < .001$ . Tukey follow-up indicated freshman and sophomores scored significantly lower than juniors who were significantly lower than seniors. Knowledge of contraception was also found to differ among groups,  $F(3, 902) = 20.11, p < .001$ , with the scores of freshmen significantly lower than sophomores whose scores were significantly lower than juniors and seniors.

Sexual Knowledge as a Function of Previous Sex Education. To analyze group differences as a function of sex education, participants were placed into five groups reflecting past sex education: (a) no sex education (NONE,  $n = 118$ ), (b) the highest level of sex education at the elementary or junior high school level (ELEM,  $n = 95$ ), (c) the highest level of sex education at

the high school level (HS,  $n = 284$ ), (d) sex education at the college level only (COL,  $n = 68$ ), and (e) sex education at the college level as well as some lower level (COL+,  $n = 310$ ). Figure 2 presents sexual knowledge scores of these groups. Analysis of these groups using a one-way ANOVA indicated overall sexual knowledge varied with previous sex education,  $F(4, 894) = 2.92, p < .05$ . Tukey HSD follow-up tests indicated significantly lower scores in NONE and ELEM groups as compared to HS, COL, and COL+ groups. In addition, the COL group had a significantly higher score than both the HS and COL+ groups. The results of the discriminant analysis indicated that sex education groups could not be discriminated by any of the content area knowledge scores.

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Place Figure 2 about here

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### **Relationships Between Sexual Knowledge and Perceived Quality of Sex Education**

To examine the association between sexuality knowledge and participants' perception of the quality of the sex education they had received, Pearson Product Moment correlation coefficients were computed between overall quality of sex education and overall knowledge score, and quality of specific content areas with knowledge scores from content areas.

Participant's ratings of the overall quality of sex education was inversely related to overall sexuality knowledge and inversely related on STDs and HIV/AIDS. This relationship was in the opposite direction than expected, with higher ratings of quality of perceived previous sex education associated with lower levels of knowledge. Positive correlations between knowledge were found in two areas: anatomy and contraception. Despite correlations reaching traditional levels of significance, the values reflect only weak associations, and should therefore be

interpreted cautiously (See Table 2).

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Place Table 2 about here

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### **Variables Which Predict Total Sexual Knowledge**

To determine which set of variables predicted sexual knowledge, a step-wise multiple regression was conducted using gender, race, college classification, location of residence, previous sex education, and perceived quality of sex education to predict total sexual knowledge. The alpha level to enter variables into the equation was set at .01. College classification entered into the regression equation first and accounted for 10.80% of the total variance in total sexual knowledge. Race entered next adding 4.30% followed by gender which added 3.30%. Finally, perceived quality of sex education and previous sex education were also added to the equation, with the entire set of variables accounting for 19.8% (20%) of the variance in sexual knowledge (see Figure 3).

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Place Figure 3 about here

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### **Summary of findings**

Females were higher in overall knowledge and in the area of contraception. Total sexual knowledge as well as knowledge in the areas of anatomy and gender were higher in Caucasian than African American students. Overall sexuality knowledge increased with year in college as did knowledge of STDs and contraception. Overall knowledge was lowest in those who received no previous sex education or had received it in elementary school and higher in students who received sex education at the college level. Students' perceptions of the quality of sex education they had received were inversely correlated to their knowledge level.

## DISCUSSION

The overall mean percentage score of 55.39 on sexual knowledge (considered to be academically failing) was poor. African American participants' scores were significantly lower than Caucasian students, a finding similar to a previous study on sexual knowledge.<sup>22</sup> Although the level of sexuality knowledge did increase significantly as students progress in college, by this time youth in this state are already pregnant or have contracted various STDs.

Puzzling was the finding that students who had obtained sex education only in college had a mean score four points higher than those who said they had sex education at college and at some level of secondary schooling. It would be interesting to investigate further the reason/s for this (e.g., misinformation given? non-retention of facts? poor test-takers?). Whatever the reason, the findings point to a need for better K-12 sex education instruction.

An unforeseen finding was the relationship of the perceived quality of students' former sex education instruction and their SexK scores. The group mean of those students having received previous sex education was 3.17 on scale of 1 to 5 (fair to good). On all but two areas of instruction (anatomy and contraception), however, the higher they rated quality of instruction, the lower their test scores. Most importantly, the higher that students perceived their former instruction in STDs and HIV/AIDS, the lower the knowledge scores. Either the students did not receive proper instruction in those topics or they had forgotten factual information at the time of the present study. Youth who don't possess a clear understanding about STDs and HIV/AIDS may not have the skills and competencies to protect themselves from disease, perhaps as evidenced by this state's ranking in the top five in the nation on STD rates.

The last analysis was an attempt to use selected variables to determine if they would predict sexual knowledge, but only a small portion of the variance (20%) was accounted for (year in college [10.8%], being male or female [4.3%], being black or white [3.3%], quality of previous sex education [0.7%], and previous sex instruction [0.9%]). If previous sex education/instruction were of quality, this should have accounted for much more than less than 1% of the variance. The findings of this study demonstrate that students do not have command of basic sexuality knowledge. There is great need in this state for the development of quality sexuality education programs and/or the need for improvement of existing programs.

### **IMPLICATIONS FOR THE FUTURE**

Clearly, strong rationale exists to increase the level of sexual knowledge of both pre-college and college-age youth residing in this state. Many schools, however, are not adequately prepared to plan and implement quality sex education programs.<sup>5,6,23,24</sup> Training teachers in various sexuality curricula should occur in order to help them gain in level of comfort and to feel self-efficacious about delivering effective sexual health programs.<sup>24,25,26,27</sup> A need exists to change state laws and guidelines in this state, that is, schools should be allowed to begin sex education before 7<sup>th</sup> grade (using age and developmentally appropriate goals and objectives).

In summary, increasing sexual knowledge of youth is essential and, especially so, in states placing constraints or barriers on the development and implementation of comprehensive sexuality education. The ultimate goal is to protect our youth from sexual diseases that could prove fatal and from becoming “children” who beget “children.”



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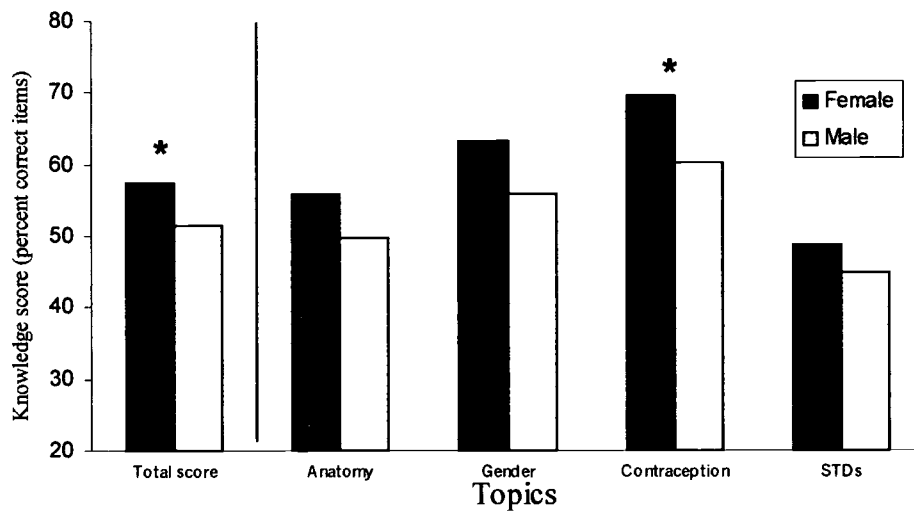
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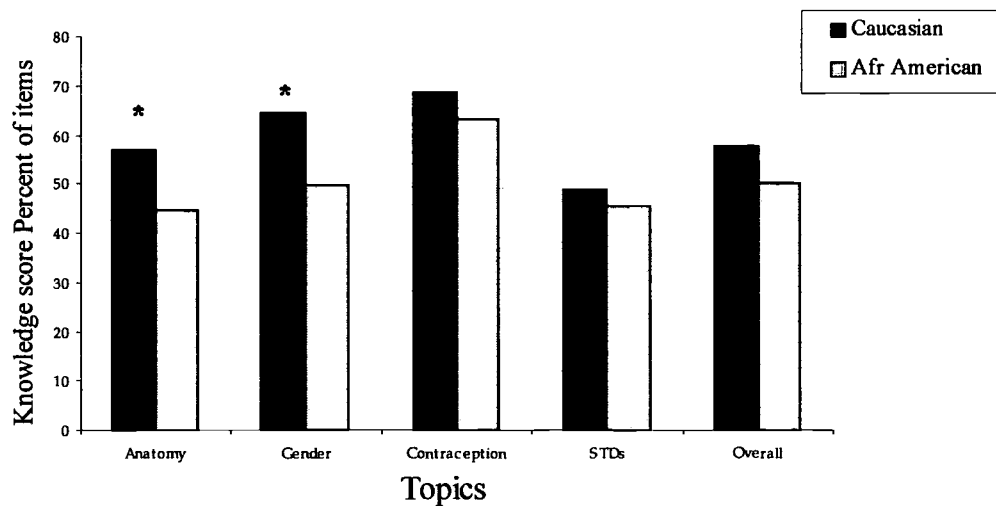
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**Figure 1 SEXK AS A FUNCTION OF GENDER AND RACE**

**Gender:  $t(913) = 5.87$   $p < .001$**



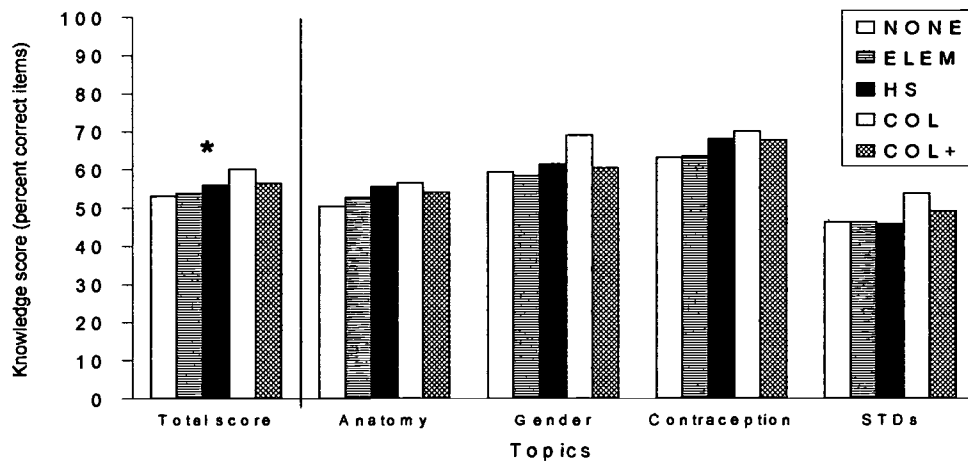
**Race:  $t(856) = 6.04$   $p < .001$**



**Figure 2 SEXK AS A FUNCTION OF LEVEL OF PREVIOUS SEX EDUCATION AND COLLEGE CLASSIFICATION**

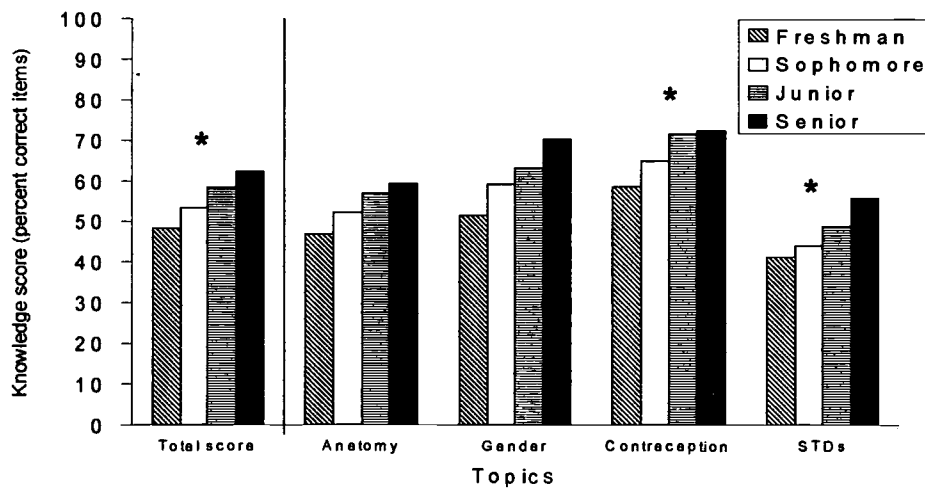
**Previous Sex Education**

Significant difference in overall SexK was found  $p < .05$



**College Classification**

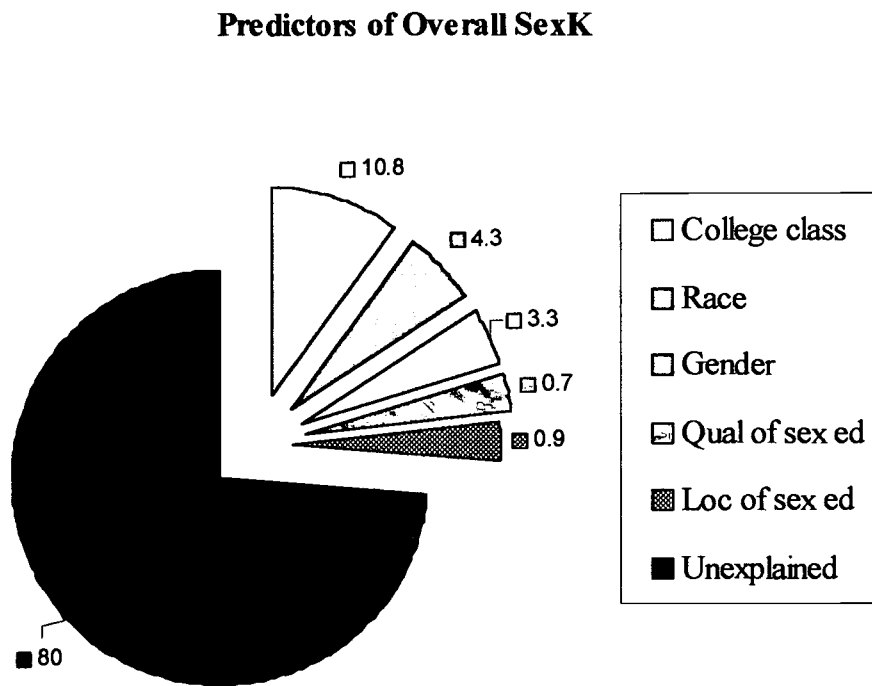
$F(3,902) = 38.66$   $p < .001$



**Figure 3**

**Results of Stepwise Multiple Regression Predicting Overall SexK**

**Alpha .01**



**Table 1****Demographic Characteristics of the Sample**

<b>Characteristic</b>	<b><u>n</u></b>	<b>%</b>	<b>Characteristic</b>	<b><u>n</u></b>	<b>%</b>
<b>Age Group</b>			<b>Race / Nationality</b>		
18 years old	122	13%	White Non-Hispanic	703	77%
19 years old	192	21%	African American	158	17%
20 to 23 years old	430	47%	Hispanic	22	2%
24 to 28 years old	114	13%	Asian	20	2%
29 years or older	54	6%	Other	11	1%
<b>College Classification</b>			<b>Location of Residence in State</b>		
Freshman	226	25%	Southeastern	452	49%
Sophomore	259	28%	Southwestern	323	35%
Junior	193	21%	Northern	129	14%
Senior	228	25%			

Note. Sums in each category may not reflect the total sample due to participants failing to provide an answer to the item.

Table 2

**Sexual Knowledge and Relationship to Perceived Quality of Sex Education**

<b>Topic</b>	<b>Quality of sex education Mean (SD)</b>	<b>Sexual knowledge Mean (SD)</b>	<b>Correlation coefficient</b>
<b>Anatomy/physiology</b>	<b>3.41 (1.10)</b>	<b>53.73 (20.90)</b>	<b>.15**</b>
<b>STDs</b>	<b>3.53 (1.14)</b>	<b>44.13 (24.88)</b>	<b>-.05</b>
<b>HIV/AIDS</b>	<b>3.57 (1.14)</b>	<b>51.37 (22.36)</b>	<b>-.04</b>
<b>Contraception</b>	<b>3.25 (1.23)</b>	<b>66.39 (21.77)</b>	<b>.08*</b>
<b>Abstinence</b>	<b>3.42 (1.19)</b>		
<b>Decision making</b>	<b>3.25 (1.12)</b>		
<b>Resistance</b>	<b>2.93 (1.19)</b>		
<b>Condom use</b>	<b>3.27 (1.26)</b>		
<b>Abortion techniques</b>	<b>2.52 (1.30)</b>		
<b>Pregnancy issues</b>	<b>3.31 (1.15)</b>		
<b>Birth information</b>	<b>3.14 (1.16)</b>		
<b>STD protection</b>	<b>3.47 (1.17)</b>		
<b>Dating/relationships</b>	<b>3.14 (1.16)</b>		
<b>Date rape</b>	<b>2.91 (1.19)</b>		
<b>Homosexuality</b>	<b>2.41 (1.26)</b>		
<b>Overall</b>	<b>3.17 (0.85)</b>	<b>55.39 (15.59)</b>	

\*  $p \leq .05$     \*\*  $p \leq .01$





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